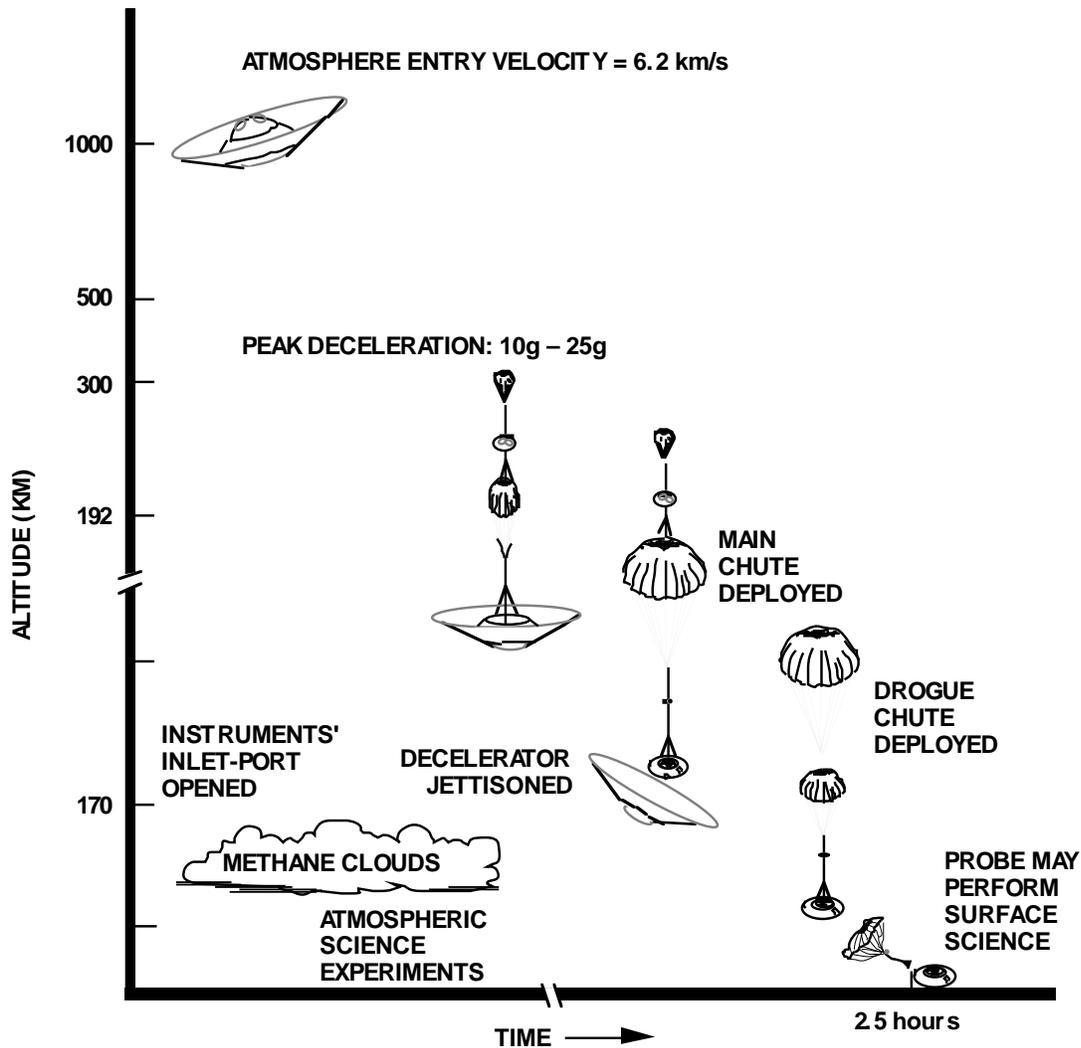


## Huygens Probe



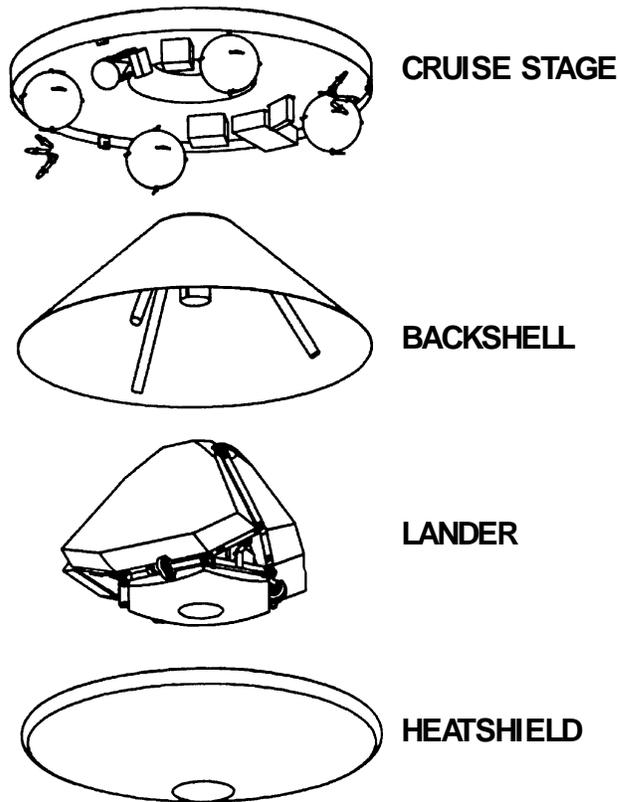
**Classification:** Atmospheric probe spacecraft

**Mission:** Investigate Titan's atmosphere

**Features:** The Huygens Probe, supplied by ESA, will be carried by the Cassini spacecraft to Titan, Saturn's largest moon, and deployed carrying six science instruments into Titan's atmosphere in the year 2004. If it survives impact with the surface of Titan, it may be able to continue to transmit science data from the surface.

**Stabilization:** Spin stabilized.

## Mars Pathfinder



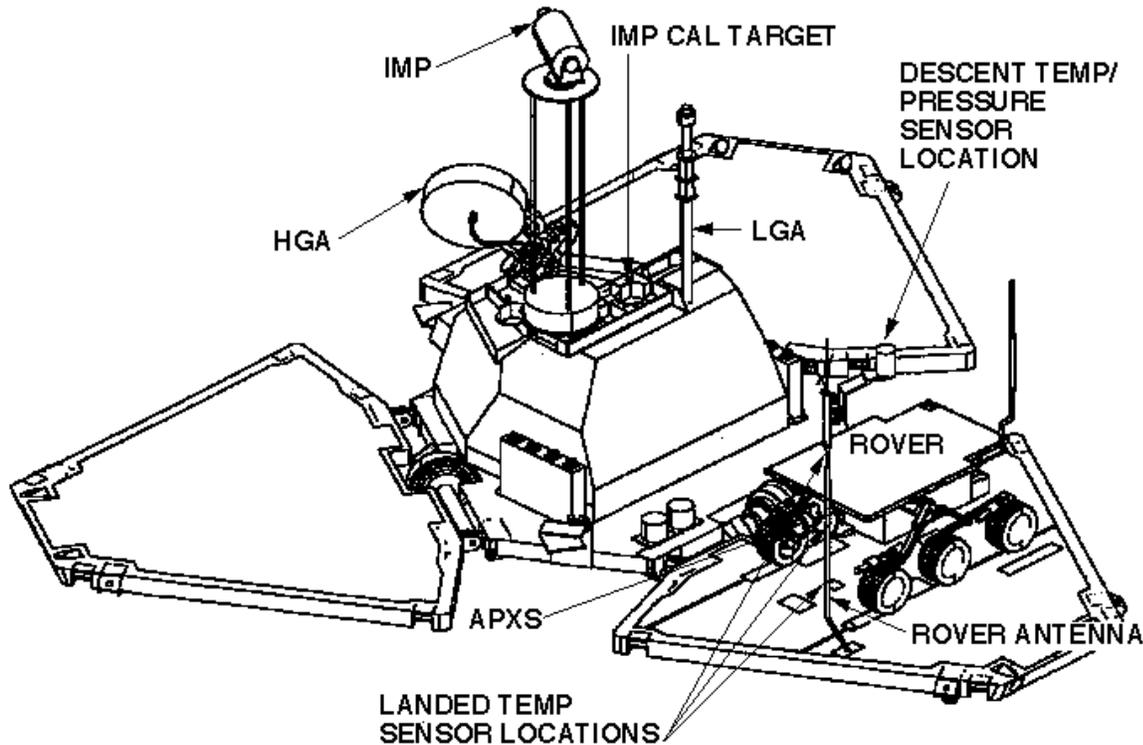
**Classification:** Lander spacecraft carrying surface rover

**Mission:** Analyze Martian soil and atmosphere

**Features:** Pathfinder is a low-cost mission with a single flight system to be launched in mid 1996, for a Mars landing late in 1997. The spacecraft will enter the atmosphere directly from its transfer trajectory and will analyze the atmosphere on the way in.

**Stabilization:** Spin stabilized.

## Mars Pathfinder Lander Deployed

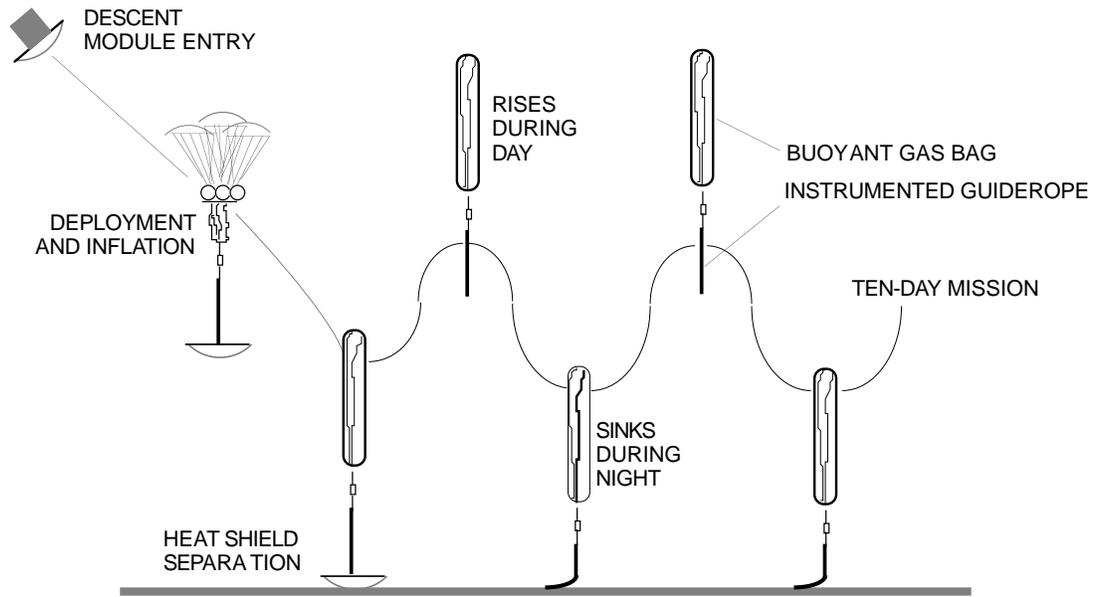


**Classification:** Lander spacecraft with surface rover

**Mission:** Analyze Martian soil

**Features:** The lander will parachute to the surface. One second before impact on the Martian surface, three airbags will inflate on each of the three folded “petals” of the lander, cushioning its impact. After the airbags have deflated, the petals then deploy, exposing solar panels to the sunlight, and righting the lander. The rover is then deployed by driving off the solar panel and onto the Martian soil. The lander is designed to operate on the surface for over 30 Martian days and nights, and return a panoramic view of the Martian landscape. It will also measure the soil’s chemistry and characterize the seismic environment.

## Mars Balloon

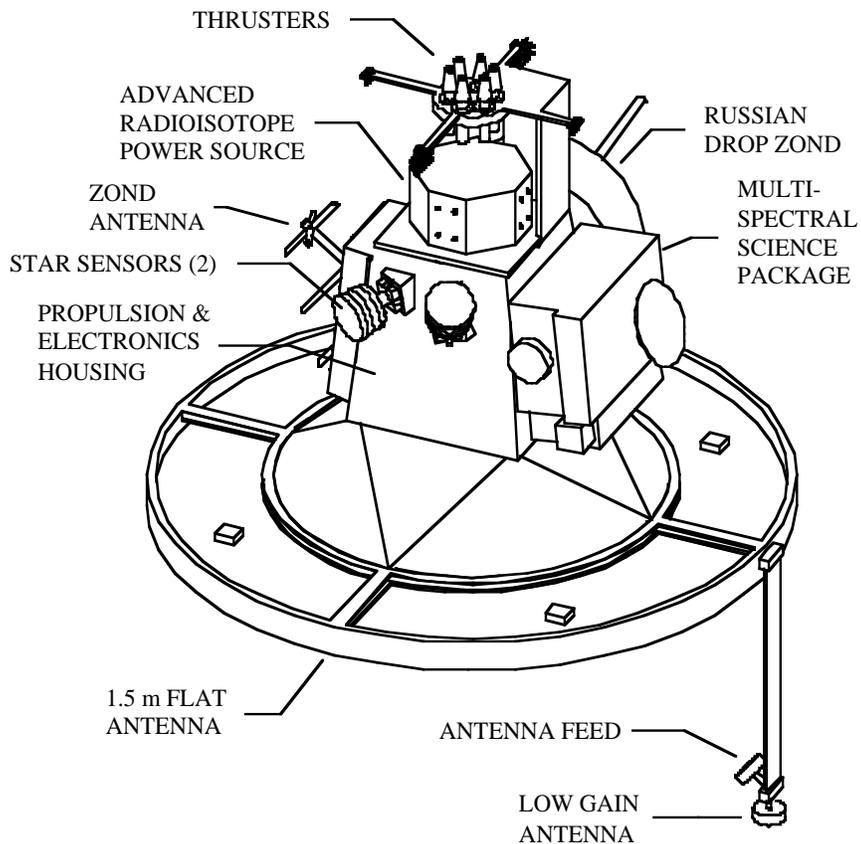


**Classification:** Balloon package

**Mission:** Explore the Martian landscape

**Features:** The balloon is designed to become buoyant enough to lift its instrumented guide rope when heated by the sun in the daytime, and to sink when cooled at night, letting the guide rope contact the surface. Electronics are fitted within 24 interconnected, partially nested, articulated conical titanium segments which make up the snake or guide rope. It carries various sensors and spectrometers, radar, data management system, transmitter, and batteries. It is intended to survive for ten Martian days and nights.

## Pluto Spacecraft



**Classification:** Flyby spacecraft

**Mission:** Conduct the first reconnaissance of Pluto

**Features:** Two low-mass spacecraft are being considered for separate launches on fast, direct trajectories to reach the Pluto-Charon system in 6 to 8 years. Science objectives established by NASA's Outer Planets Science Working Group and the Solar System Exploration Subcommittee include characterizing the global geology and geomorphology, and mapping the surface composition of both bodies, and characterize the tenuous atmosphere. It would carry an imaging camera, and UV and IR spectrometers. The fast trajectories would allow the spacecraft to reach their target before the atmosphere precipitates to the surface, which is predicted to occur around the year 2015 as Pluto moves farther from the sun. The proposed spacecraft would have a mass of about 150 kg including propellant, would operate on 60 watts of electrical power, and provide a downlink at a maximum of 40 bps. The launch vehicle candidates are Titan IV with Centaur upper stage, or Proton.

**Stabilization:** Three-axis stabilized by thrusters.

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## Recap

1. Detailed models of many spacecraft may be found in the \_\_\_\_\_  
Museum, JPL Building 186 and in the SAF North Viewing Gallery, Building \_\_\_\_\_.
2. Voyagers 1 and 2 are classified as \_\_\_\_\_ spacecraft.
3. Magellan, Mars Observer, and Cassini are classified as \_\_\_\_\_ spacecraft.
4. The Mars Pathfinder mission will deploy multiple \_\_\_\_\_ spacecraft on Mars.

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1. Von Kármán , 179    2. flyby    3. orbiter    4. lander

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